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PHOTOGRAPHIC INTERPRETATION REPORT

CHRONOLOGY OF  
EXPLOSIVES AND PROPELLANT PLANT 850  
AND THE ROCKET MOTOR TEST FACILITY  
STERLITAMAK, USSR

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## CHRONOLOGY OF EXPLOSIVES AND PROPELLANT PLANT 850 AND THE ROCKET MOTOR TEST FACILITY, STERLITAMAK, USSR

### INTRODUCTION

This report, one of a series of chronological development studies of Soviet solid propellant production plants and their associated rocket motor test facilities, is concerned with Explosives and Propellant Plant 850 (BE [redacted] 53-40N 055-57E) and the associated Rocket Motor Test Facility [redacted] 53-41N 055-58E) at Sterlitamak, USSR. The 2 facilities (Figure 1) are located approximately 4.5 nautical miles north of Sterlitamak. In the report, the facilities will be referred to as the Double Base Propellant Plant and the Test Facility, respectively (Figures 2, 3, and 4). The 2 facilities are rail served and secured. Item numbers referred to in the text are keyed to Figure 4 and Table 1.

The nitroglycerin production area of the Double Base Propellant Plant contains 4 nitration lines. Two of the lines appear to be older Schmid/Meissener-type continuous nitrators and appear to be identical to those recently identified at Solikamsk Double Base Propellant Production Plant [redacted] 1/. The other 2 lines appear to use the newer Biazzi-type continuous nitration process and appear identical to those identified at Kamensk-Shakhtinskiy, Perm, Biysk, Solikamsk, and Krasnoyarsk. 1-5/ The Double Base Propellant Plant also contains a typical Soviet nitrocellulose production area (items 24-29) and a probable nitrocellulose production area (items 149-156) which includes a nitric acid facility and an acid recovery system similar to those found at the above-mentioned plants. A large double base processing area contains facilities that provide a capability for the extruding and casting of solid rocket motors of various sizes. Numerous probable machining and finishing buildings are also located within the double base processing area. Supporting elements within the Double Base Propellant Plant include a possible cellulose separation plant which is supported by the wood pulp processing facilities that

are located at the south end of the Double Base Propellant Plant. A storage area, located directly northeast of the Double Base Propellant Plant, is secured by a double fence and contains 13 rail-served rocket motor/propellant storage buildings and 2 small revetted buildings possibly used for igniter storage (Figure 2).

Recent [redacted] photography obtained in [redacted] [redacted] has allowed a detailed functional analysis of the Double Base Propellant Plant and the Test Facility. A line drawing of the Double Base Propellant Plant and the Test Facility (Figure 4) is color coded to indicate the construction chronology of most of the structures in the 2 installations. Table 1 is keyed to the line drawing and presents relevant data for all major structures. The table is divided into 2 sections corresponding to

the Double Base Propellant Plant and the Test Facility. Steamlines and rail spurs are not included in the color coding due to a lack of sufficient early photography to follow their development from 1962-1967. Perspective and plan views of the casting and mixing building (item 105, plant area), the large horizontal test cell (item 1, test area), and the large assembly/checkout buildings (item 18, test area) are presented in Figures 5-7, respectively.

### HIGHLIGHTS OF CHRONOLOGY

#### 1944-1962

The Double Base Propellant Plant was not present on [redacted] photography of the site. It was first observed on [redacted] photography of [redacted]. The nitroglycerin and nitrocellulose production areas and double base processing area were essentially complete on this photography. The plant had a conventional double base extrusion capability at that time.

The Test Facility, located at the north end of the complex, contained several significant structures which were probably complete. The large horizontal static test position and the associated H-shaped high-bay assembly/checkout buildings (items 1 and 18, test area) were the most significant structures in the Test Facility. Similar assembly and checkout buildings have been identified at Biysk and Krasnoyarsk. 4, 5/

#### 1963

The significant construction during the year was centered in the completion of numerous propellant processing structures whose probable function is the machining and final processing of double base propellant grains. In addition, 2 sets of rail-served "offset" buildings (items 2 and 3, plant area) were either complete or close to com-

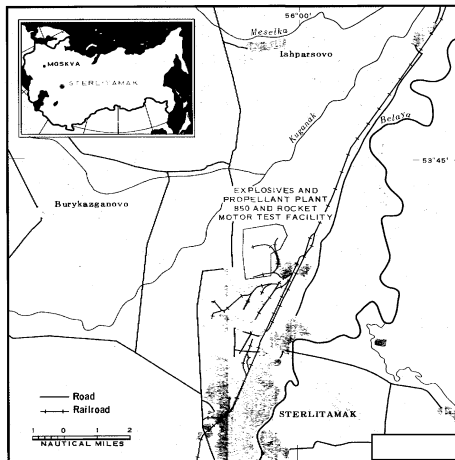


FIGURE 1. LOCATION MAP.

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FIGURE 2. EXPLOSIVES AND PROPELLANT PLANT 850 AND THE ROCKET MOTOR TEST FACILITY, STERLITAMAK, USSR.

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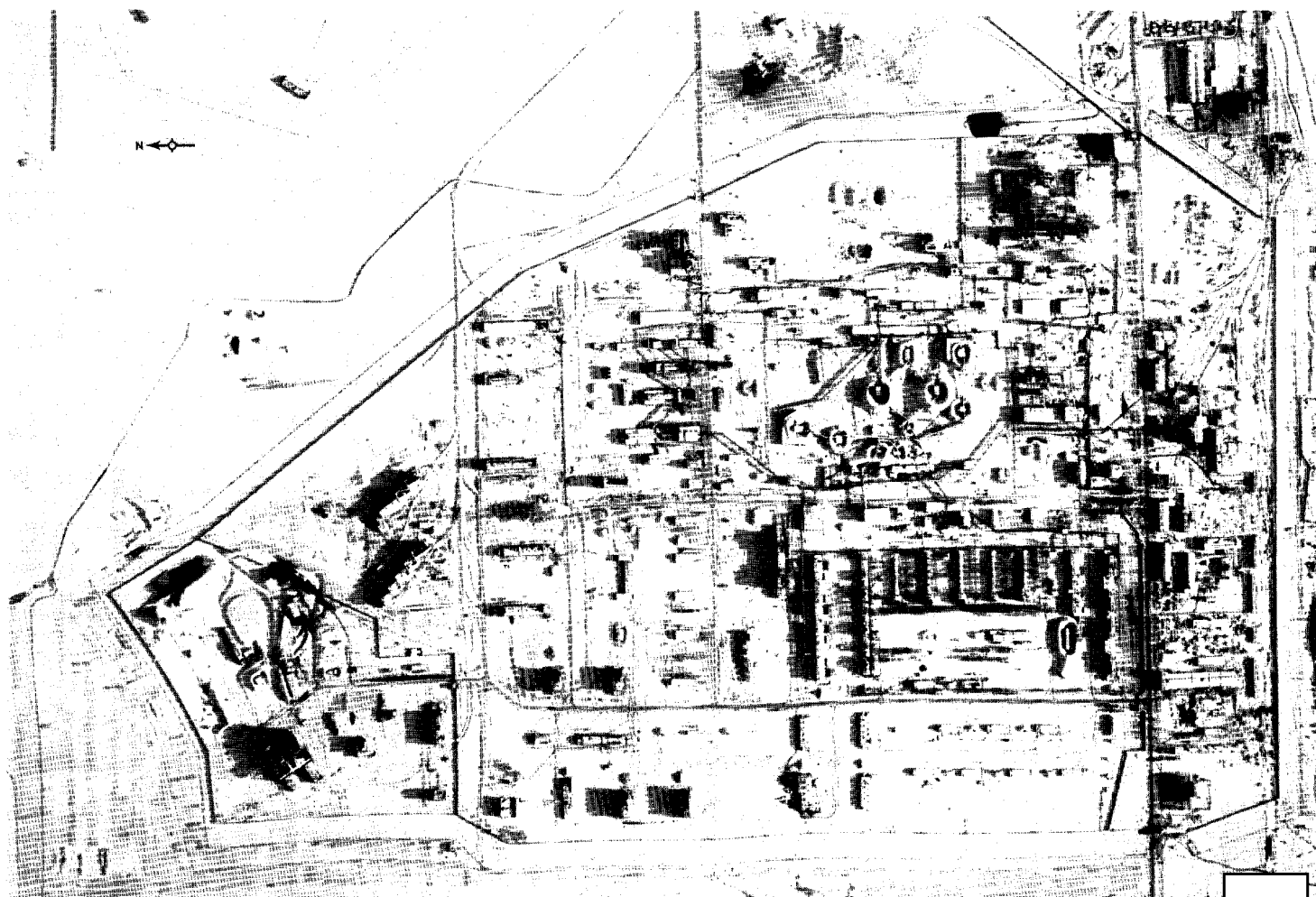


FIGURE 3. DOUBLE BASE PROPELLANT PLANT AND TEST FACILITY

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Table 1. Description and Dimensions of Structures at the Double Base Propellant Plant and Test Facility, Sterlitamak, USSR  
(Item numbers are keyed to Figure 4)

Item	Function/Description	Explanatory Notes	Item	Function/Description	Explanatory Notes
<b>DOUBLE BASE PROPELLANT PLANT</b>					
1	Tank	May contain fuel oil; appears ventilated	107	Double base processing bldg	Partially protected by eastern barricade
2	Prob temperature conditioning bldgs	May be used as rocket motor storage/curing; 3 southern parts complete in [ ]	108	Storage bldg	Associated with small earth-covered bunker
3	Prob temperature conditioning bldgs	Construction well advanced when first observed	109	Lag storage bldg	Appears to be in midstage of construction
4	Support bldg		110	Lag storage bldg	
5	Support bldg		111	Double base processing bldg	
6	Poss admin bldg/laboratory		112	Support bldg	
7	Prob curing/assembly bldg		113	Double base processing bldg	
8	Prob curing/assembly bldg		114	Double base processing bldg	
9	Poss curing/assembly bldg	May be final assembly bldg for a double base casting line	115	Double base processing bldg	
10	Poss curing/assembly bldg		116	Double base processing bldg	
11	Motor storage/assembly bldg		117	Lag storage bldg	Associated with small earth-covered bunker
12	Motor storage/assembly bldg		118	Double base processing bldg	
13	Tank	Poss a boiler connected to heating system; covered by northern tank	119	Poss boilerhouse	
14	Prob control bunker		120	Lag storage bldg	
15	Motor storage/assembly bldg		121	Storage bldg	
16	Poss curing/assembly bldg	Processing control/personnel bunker associated with this item	122	Earth-covered bunker	
17	Guardhouse		123	Lag storage bldg	
18	Prob acid plant	Height of bldg indicates vertical tanks associated with acid plant	124	Lag storage bldg	
19	Prob acid plant		125	Lag storage bldg	
20	Prob acid plant		126	Lag storage bldg	
21	Prob acid plant		127	Lag storage bldg	
22	Cooling tower		128	Support bldg	
23	Prob ammonia storage section	3 columns	129	Lag storage bldg	
a	Prob pumphouse	Prob present; poor interpretability of photography precludes positive identification	130	Lag storage bldg	
b	Prob ammonia tank	Earth-covered tank, diameter approx	131	Lag storage bldg	
c	Prob ammonia tank	Earth-covered tank, diameter approx	132	Lag storage bldg	
d	Prob ammonia tank	Earth-covered tank, diameter approx	133	Lag storage bldg	
e	Prob ammonia tank	Earth-covered tank, diameter approx	134	Lag storage bldg	
f	Prob ammonia tank	Earth-covered tank, diameter approx	135	Lag storage bldg	
g	Prob off-loading point	Rail served	136	Lag storage bldg	
24	Cellulose recovery/cellulose treatment bldg	Rail served; connected by 6-pipe gallery to item 25	137	Support bldg	
25	Prob mixer	Connected to item 28 by pipeline; height given in for low-bay section	138	Poss cellulose preparation bldg	
26	Poss heating tank house	Contains 3 high-bay sections	139	Cooling tower	Contains a cooling column
27	Final nitrocellulose processing bldg	Connected by conveyor to double base processing area	140	Poss cellulose preparation bldg	Multilevel vented roof; connected by conveyor to item 143
28	Byproducts recovery bldg	Connected by conveyor to item 28	141	Poss cellulose preparation bldg	Contains 6 horizontal tanks along N side
29	Nitrocellulose processing bldg		142	Poss cellulose preparation bldg	
30	Nitrocellulose processing bldg		143	Tank	
31	Nitrocellulose processing bldg		144	Storage/compressor bldg	Served by 2 rail spurs
32	Cooling tower	3 columns	145	Support bldg	
33	Nitrocellulose processing bldg		146	Support bldg	
34	Support bldg		147	Poss glycerine bldg	
35	Laboratory/support bldg	C-shaped recessment probably indicates sensitive storage	148	Support bldg	
36	Storage bldg/workhouse		149	Prob cellulose treatment bldg	
37	Double base processing bldg		150	Prob cellulose treatment bldg	
38	Double base processing bldg		151	Prob acid recovery bldg	
39	Double base processing bldg		152	Water tower	Connected to item 153; contains distillation columns along side
40	Double base processing bldg		153	Prob strainer bldg	Connected by conveyor/pipe gallery to item 155; pipeline passes over item 154
41	Storage bldg		154	Prob byproducts recovery bldg	
42	Double base processing bldg		155	Final nitrocellulose processing bldg	
43	Double base processing bldg		156	Nitrocellulose processing bldg	
44	Double base processing bldg		157	Support bldg	
45	Support bldg		158	Storage bldg	
46	Double base processing bldg	Shall fenced area adjacent to bldg may contain transformer equipment	159	Poss admin bldg	
47	Double base processing bldg	Connected to item 40 by conveyor	160	Warehouse	
48	Vertical storage tanks	Offloading facility suggests acid/glycerine handling	161	Warehouse	
49	Support bldg		162	Warehouse	
50	Ingrephene preparation bldg	Connected to item 78	163	Support bldg	
51	Ingrephene preparation bldg	Presence of fractionating column indicates poss acid recovery	164	Storage/shop bldg	
52	Support bldg		165	Storage/shop bldg	
53	Support bldg		166	Support bldg	
54	Support bldg		167	Support bldg	
55	Ingrephene preparation bldg		168	Poss wood pulp processing bldg	
56	Support bldg		169	Conveyer feed bldg	Multilevel structure fed by large conveyor system
57	Nitrocellulose processing bldg		170	Unloading bldg	Feeds conveyor system for item 168
58	Poss acid recovery bldg		171	Tank	Earth-covered poss byproducts/slurry tanks
59	Nitrocellulose processing bldg		172	Prob pumphouse	
60	Storage/control bldg	High stacks and associated buried tanks support identification	173	Tank	Earth-covered poss byproducts/slurry tanks
61	Vertical tank	C-shaped recessment with protected entrance indicates sensitive storage/control function	174	Tank	Earth-covered poss byproducts/slurry tanks
62	Support bldg		175	Tank	
63	Support bldg		176	Tank	
64	Support bldg		177	Wood pulp processing bldg	
65	Air-d preparation/storage bldg	Contains rail offloading points indicating receiving of nitroglycerin ingredients	178	Wood pulp processing bldg	
66	Support bldg		179	Support bldg	
67	Ingrephene preparation bldg	Probably utilized as a compressor bldg providing logistical support to vitration facilities	180	Shipping/storage bldg	
68	Ingrephene preparation bldg	Associated with item 68 and connected to vertical cylinders adjacent to items 68 and 69	181	Shipping/storage bldg	
69	Ingrephene preparation bldg		182	Shipping/storage bldg	
70	Acid pressur bldg		183	Shipping/storage bldg	
71	Nitrator/seperator bldg		184	Shipping/storage bldg	
72	Nitrator/seperator bldg		185	Shipping bldg	
73	Nitroglycerin magazine		186	Shipping bldg	
74	Nitroglycerin magazine		187	Shipping bldg	
75	Nitroglycerin magazine		188	Cooling tower	
76	Nitrator/seperator bldg		189	Support bldg	
77	Nitrator/seperator bldg		190	Poss light fabrication bldg	
78	Nitrator/seperator bldg	Heavily revetted; connected by conveyers/pipelines to items 20, 79, and 80	191	Shipping bldg	
79	Nitrator/seperator bldg	Heavily revetted; connected by conveyers/pipelines to items 70 and 80	192	Shipping bldg	
80	Nitrator/seperator bldg	Heavily revetted	193	Shipping bldg	
81	Prob processing/control bldg		194	Shipping bldg	
82	Double base processing bldg		195	Prob packing bldg	
83	Double base processing bldg	Appears identical to item 87	196	Support bldg	
84	Poss nitrocellulose processing bldg		197	Support bldg	
85	Storage bldg/workhouse		198	Support bldg	
86	Prob nitroglycerin processing bldg	Appears identical to item 84	199	Support bldg	
87	Nitrocellulose processing bldg	Rail served	200	Support bldg	
88	Double base processing bldg		201	Guard barracks	
89	Support bldg		<b>TEST FACILITY</b>		
90	Flow control bldg		1	Large horizontal test cell	
91	Double base processing bldg		2	Small horizontal test cell	
92	Support bldg		3	Poss observation bldg	
93	Support bldg		4	Control bldg	
94	Nitroglycerin flow control bldg	Connected by pipeline with nitroglycerin area and double base propellant processing and casting area	5	Poss batch/quality testing bldg	
95	Support bldg		6	Test support bldg	
96	Support bldg		7	Support bldg	
97	Flow control bldg		8	Support bldg	
98	Support bldg		9	Support bldg	
99	Double base processing bldg	Possibly controls nitroglycerin flow to double base casting facility	10	Guardhouse	
100	Double base processing bldg	Propellant processing and extrusion bldg	11	Poss firing inspection bldg	
101	Double base processing bldg		12	Poss firing inspection bldg	
102	Double base processing bldg		13	Poss boilerhouse	
103	Double base processing bldg		14	Prob prefiring storage bldg	
104	Double base processing bldg		15	Small test position	
105	Double base casting and mixing bldg		16	Pumphouse	
106	Double base processing bldg	Casting section on W is heavily revetted and measures [ ]	17	Tank	
		Propellant processing and extrusion building	18	Assembly/checkout bldg (s)	
			19	Tank	
			20	Tank	
			21	Poss observation bldg	
			22	Test control bldg	
				Total roof cover	

\*All lengths and widths are overall measurements; all heights are to the highest part of the structure.  
\*Complete when first observed unless otherwise noted.

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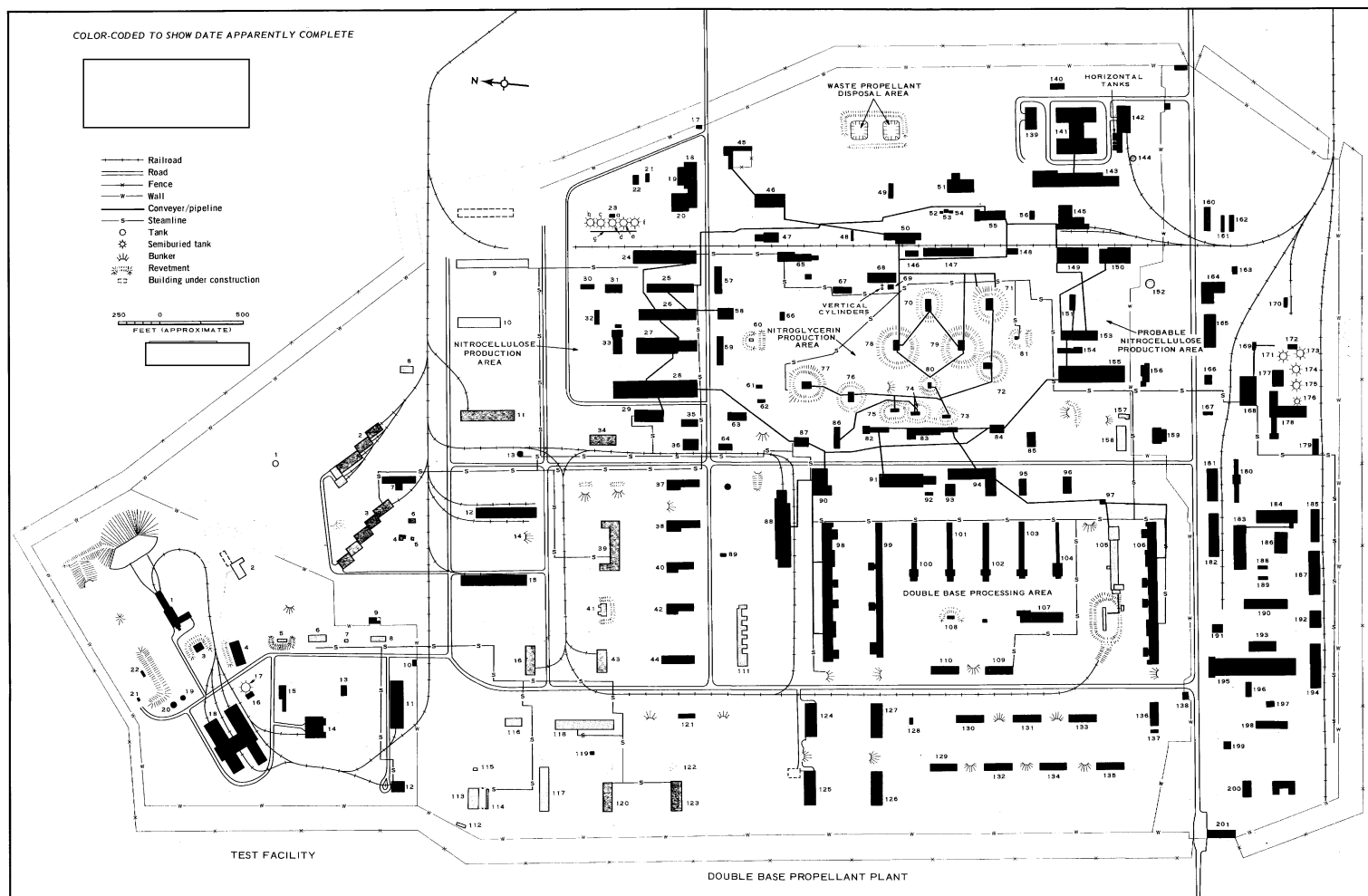


FIGURE 4. LAYOUT OF DOUBLE BASE PROPELLANT PLANT AND TEST FACILITY.

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FIGURE 7. PERSPECTIVE VIEW AND DIMENSIONS OF THE ASSEMBLY/CHECKOUT BUILDINGS (item 18, test area).

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MAPS OR CHARTS

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- 2. NPIC. [redacted] *Advanced Solid Propellant Production Area, Chemical Combine No 101, Kamensk-Shakhtinskiy, USSR, Dec 66* (TOP SECRET [redacted])
- 3. NPIC. [redacted] *Chronological Development of Selected Solid Propellant Facilities at the Munitions and Chemical Combine K. Kirov No 98, Perm, USSR, Feb 67* (TOP SECRET [redacted])
- 4. NPIC. [redacted] *Chronological Development of Solid Propellant Rocket Motor Test and Propellant Production Facilities, Biysk, USSR, Dec 66* (TOP SECRET [redacted])
- 5. NPIC. [redacted] *Chronological Development of the Krasnoyarsk Solid Propellant Rocket Motor Test and Production Facilities, Krasnoyarsk, USSR, [redacted] Apr 67* (TOP SECRET [redacted])
- 6. NPIC. [redacted] *Solid Propellant Rocket Motor Test Facilities and Probable Solid Propellant Production Facilities, USSR, Jun 65* (TOP SECRET [redacted])

REQUIREMENT

CIA. C-DI5-82,973

NPIC PROJECT

11212/66 (partial answer)



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